

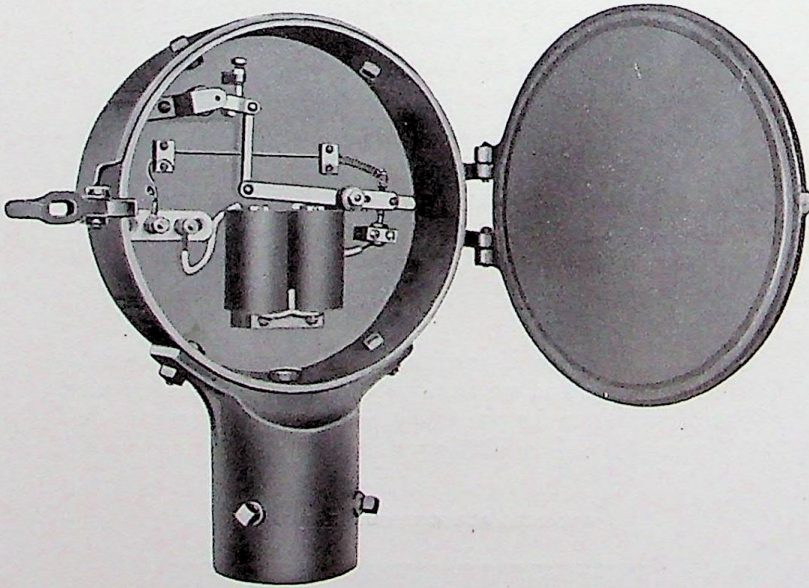
FEBRUARY, 1916

BULLETIN NO. 3

The Model "E"

A. C. and D. C.

Highway Crossing Bells



MANUFACTURED BY

The Protective Signal Manufacturing Co.

1421-1439 EIGHTEENTH STREET

DENVER, COLORADO, U. S. A.

INTRODUCTION

IN the development of the Model "E" Bell, herein described, we have not deviated from the basic operating principle which has been our bell standard for the past four years.

We have given careful consideration to the suggestions offered by various signal men in the construction of this bell and have endeavored to embody all features that tend toward making it highly efficient, durable, economical and reliable. At the same time we have reduced the number of parts, simplified the operating mechanism, eliminated all possible troubles from moisture and dust, and made it more accessible for inspection and maintenance.

The heart of any electrical device is the CONTACT MECHANISM, and we believe that in our Model "E" Bell this part of its mechanism is as near perfect as can be made. Adjustments are easily and quickly made, and due to the construction and method of operation of the contact switch the contacts will last indefinitely without renewal.

Our bells have been in service for years on the various roads of the country and we have yet to find a dissatisfied user. Permit us to make you a proposition on your next bell requirements. It will pay you.

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DESCRIPTION

IN order that our alternating and direct current bells might be of uniform design and outward appearance the Model "E" Bell is made in three distinct types.

Type "A" for alternating current operation on 55 or 110 volts at 60 cycle.

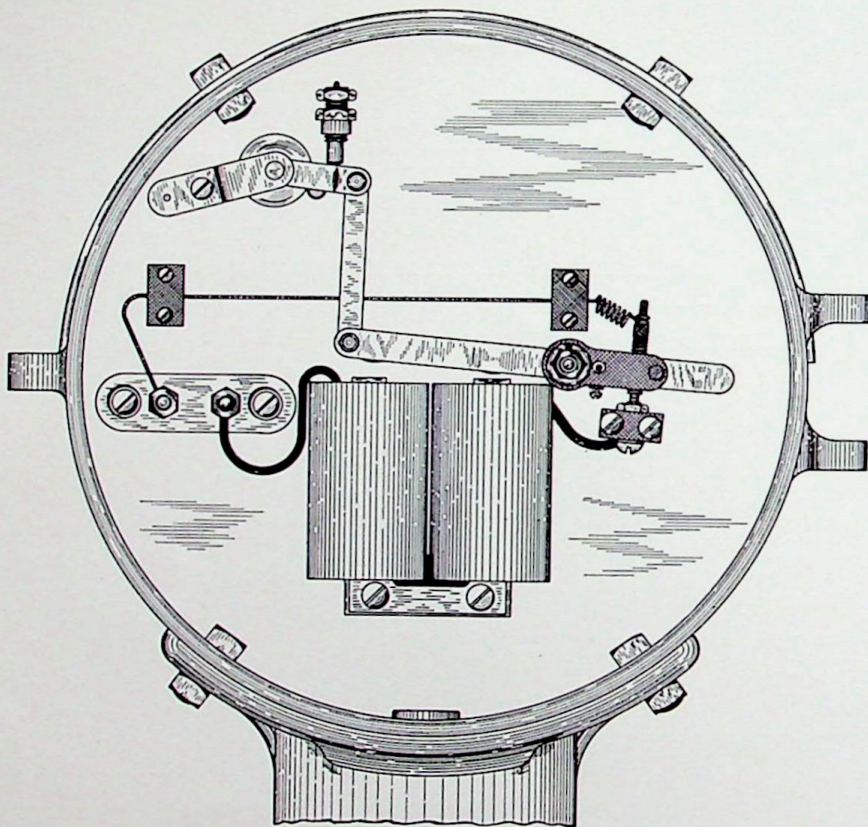
Type "AA" for alternating current operation on 55 or 110 volts at 25 cycle; and

Type "B" for battery or direct current operation of from 6 to 12 volts.



Model E Bell Complete. Fig. 1.

The only difference in the alternating and direct current types is in the magnet coil units. All parts are interchangeable and are made of the finest materials obtainable. It is our idea in the construction of our bells to make all parts rugged and durable, eliminate friction in moving parts as much as possible, and make the salient and important parts as near perfect as we can. The service which these bells have rendered in the past will prove that our efforts in this connection have not been in vain. We believe that good workmanship and the best of materials in any device are essential to good service and reliability, and our devices are all made on these lines.



Interior of Model E Bell. Fig. 2.

In the construction of our A. C. Bells particular attention and study has been given to the laminated cores and magnet coils. The laminations of these bells are made of the finest grade of soft sheet iron, which can be purchased. The coils are wound with single cotton covered enameled wire, and each coil is tested before being assembled. The coil bobbins are held in place on the cores by strong cotter pins, making them absolutely secure and at the same time easily removed. The connections of the coils are of flexible wire and thoroughly protected by suitable outside covering. The magnet coil unit is mounted direct to the bell base, and held in place by two large screws so that it may be removed and renewed without the necessity of even removing the bell from the pole. The connections from the magnet coils are made to RSA Terminal binding posts on the interior of the bell casing. The outside connecting wires are carried through the base of the bell mounting to the RSA terminals.

All leads are suitably insulated and held in place by fibre cleats.

The armature, clapper fulcrum, and other steel parts are copper plated to prevent rust, and clapper bearings are made of crossed metals to insure proper operation. All steel pins and studs are hardened and blued.

The contact switch block is made in one unit, connection to which is quickly and easily made and so installed that it can be removed without the necessity of taking the bell from the pole. This block is made of bakelite and carries the upper contact which is of the plunger type and adjustable to regulate the proper stroke. The lower contact unit is stationary and thoroughly insulated from the bell casing. The operation of the contact unit is absolutely positive and, owing to the wiping surface given to the contacts, there is no possibility of corrosion.

Contacts are made of irridio platinum, or tungsten. Carbon contacts can also be furnished if desired.

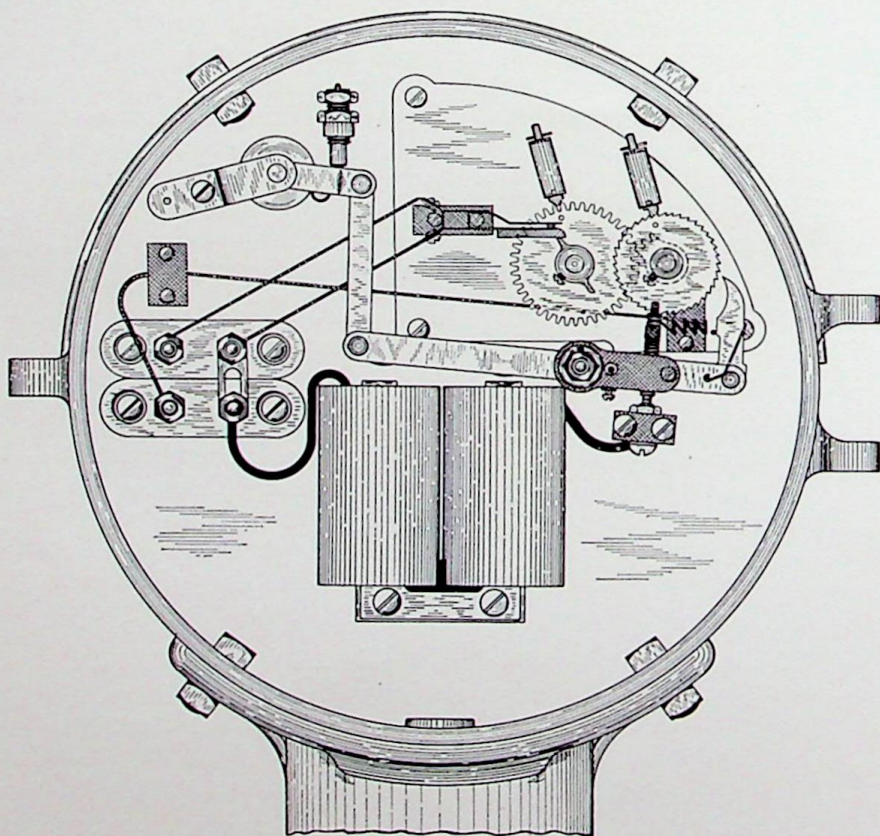
The back stroke of the clapper fulcrum is cushioned by a plunger bumper, by means of which the number of strokes per minute of the clapper can be regulated. This plunger bumper is securely located, and after once adjusted for the proper number of strokes can be locked in place. The stroke of the bell clapper can be regulated by the plunger bumper to deliver from 150 to 225 blows per minute.

All the operating mechanism of this bell is located on the interior of the bell casing. No moving parts are exposed except the clapper, which is thoroughly protected by the gong and hood. The interior of the bell is protected by a hinged door, which permits inspection during operation.

The door is equipped with a heavy wool gasket, which is forced into a groove cast on the outer edge of the door and cemented in place. When closed, this gasket is pressed tightly against the edge of the bell casing, making it absolutely dust and water proof. The door is also equipped with a special designed latch, which assists in opening the door, as well as to give an even pressure to the entire surface of the door when closed.

The gong is made of pressed steel 12 inches in diameter and designed to give a loud, clear ring. It is protected by the hood, which extends down over the sides nearly half way, and tends to divert the sound waves downward.

The Model "E" Bells are designed to be mounted on the top of an iron or wooden pole, or upon a bracket at the side of the pole. The proper bell mountings are included with each bell, with the exception of the cast iron bracket. All mountings are made to permit the connection wires being carried through the bottom of the bell casing.



Interior of Model E. Bell with Time Element. Fig. 3

If desired, these bells can be equipped with a time element unit, which is mounted on the interior of the bell casing (Fig. 3). By means of these time units any desired ringing time can be obtained of from 30 seconds to 2 minutes and 40 seconds. The unit is operated by a ratchet pawl on the bell armature and the time is governed by the segment gear on the ratchet wheel bearing, or the cams on the time gear. The operation of this unit is entirely automatic and positive.

The time elements are particularly well adapted to country crossings where the ringing of the bell after a train has passed the crossing is not objectionable, and this method of operation is a very economical one so far as the first cost is concerned.

A lighting unit similar to the time element unit can be furnished if it is desired to operate lights in connection with the bell. By means of these units, lights can be cut in and remain lighted while the bell is in operation or can be flashed during its operation.

If desired the light and time elements can be combined and the bell equipped with both features by the use of the one unit.

OPERATION

THE operation of these bells is very simple. When circuit is closed to the bell magnets the armature is attracted to the poles, operating the clapper fulcrum and the clapper is thrown suddenly against the gong. At the same time the armature switch pin engages the switch block and opens the contacts, allowing the armature to return to normal position by gravity, when the pin again engages the switch block in the opposite direction and closes the contacts again energizing the bell magnets. This operation is repeated until the bell circuit is opened.

When bell is equipped with the time or light element, the operation of the armature propels the ratchet wheel of the element by a ratchet pawl on the end of the armature (Fig. 3) and, as the bell circuit is governed by the time element, the operation is repeated until the ratchet makes its required number of revolutions and bell circuit is again opened by the switch cams on the gear wheel bearing.

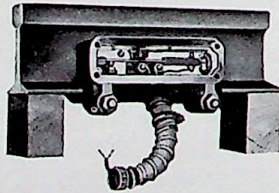
The current consumption of the Direct Current Bell is 300 milo amperes, and the alternating current bells consume 2.5 watts.

Prices of our "Model "E" Bells will be given upon request. Our bells are absolutely guaranteed against imperfections in material and workmanship and any part found imperfect will be replaced free of charge. We stand behind all our apparatus and assure entire satisfaction.

CONCLUSION

WE will be pleased to submit blue prints showing proper wiring diagrams and circuits to cover any protection, embodying our various devices, as well as quotations or any further information in connection with any of our systems, upon application. A blue print or rough sketch showing existing conditions at the point where protection is desired will greatly assist us in making our recommendations and estimates of cost.

We guarantee our devices and stand back of all our apparatus.



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